The History of Injury and Industrial Disease Rates in British Columbia from 1950 to 1996

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The purpose of this investigation is to describe changes in industrial injury and disease rates in British Columbia between 1950 and 1996. Although epidemiological data are used throughout this report, the method and objectives are largely descriptive and historical.

One of the drawbacks of conducting a study using administrative WCB data is that most information on injury and disease is based on accepted claims. Although claims acceptance rates are obviously related to underlying disease and injury rates and temporal change in these, the claims acceptance process is an administrative and policy filter which limits the extent to which these data can describe the entire at-risk working population. For this reason, data on death and injury report rates are highlighted as these are better measures of incidence, at least in the insured working population.

METHODS

All data on injury and disease rates were abstracted manually from WCB Annual Reports for the years 1950 through 1996 (British Columbia Workers’ Compensation Board Annual Reports, 1950-1996). Injury and death report rates and time-loss claim rates were available from 1950 to 1996 in the Annual Reports. Detailed breakdown of industrial disease data was only available in the reports from 1959 to the end of 1996. The denominator for rates, an estimate of the number of workers insured by the WCB in a given year, was obtained from the Statistics Department (British Columbia Workers’ Compensation Board Statistics Dept., 1998).

The WCB has used 15 broad categories since 1950 to describe injuries. In order to track injury reports and claims over the entire study period, these 15 were reduced to three categories (Appendix A). Similarly, because of the large number of industrial disease categories, these were collapsed into six large categories: respiratory disease; hearing loss; repetitive motion disease; dermatitis; diseases due to radiation exposure; and other diseases. For this rationalization, diseases that represented more than 10% of claims throughout the study period were selected and grouped on the basis of similarity of exposure and/or outcome (Appendix B).

RESULTS

The BC workforce and WCB insurance coverage (1950-1996)

During the study period, the BC economy underwent major transformation from a largely resource to service economy. The economy also increased in size and complexity. During this time, the proportion of workers covered by the WCB did not change appreciably (Table I).

The number of workers employed in BC nearly quadrupled between the early 1950s and the 1990s, as did the number of workers covered by the WCB. Insurance coverage at the WCB remained fairly constant between 75 and 80% of the workforce with some decrease in coverage during the 1980s. This means that in terms of the epidemi-
ology of injury and industrial disease in the province, the experience of approximately 25% of workers in the province was not captured using WCB administrative data.

The types of workers not covered by the WCB vary over time as groups obtained coverage at different times. For example, various categories of self-employed workers remain outside the WCB system. Historically, fishermen, farmers, and farmworkers also remained outside the system until the 1970s and 1980s.

**Rates of reported deaths, injuries, and claims for injury and disease**

The death report rate to the WCB was 67.3 per 100,000 insured workers during the 1950s. This dropped steeply through the 1960s and by the 1970s was less than half that observed in the 1950s. During the 1980s and 1990s, the death report rate halved again to 14 per 100,000 insured workers (Table II).

Figure 1 shows the changing injury report rate and time-loss claims rate. (It should be noted that the relationship between injury report and claims acceptance rates is governed by many factors including the severity of the injury, shifts in claims administration policy, and the implementation of “return-to-work” policies.) Between 1953 and 1996, the injury report rate declined. Most of this decline occurred before 1969. During the 1970s, the injury report rate increased. In 1980 the injury report rate began to decrease again and by 1992, reached levels seen in 1969. Since 1992 there has been a slight decline in the injury report rate.

During the study period, the death report rate decreased by 79% and the injury report rate declined by 29%. The time-loss claims rate remained relatively flat fluctuating between 8 and 5 time-loss claims per 100 insured workers during the entire 46-year study period.

Over 95% of time-loss claims during the study period were accounted for by short-term claims. The remaining 5% of time-loss claims were due to claims for permanent disability, fatal injuries, and industrial disease. The rates for these latter claims are shown in Figure 2.

Approximately 80% of reported deaths result in an accepted fatal claim at the WCB so the decrease in accepted fatal claims mirrors the decrease in reported deaths during the study period. The pattern of accepted permanent disability claims remained comparatively flat over the study period. The pattern of accepted industrial disease claims appears similar to that demonstrated for injury report rates (See Figure 1). As short-term time-loss claims account for over 95% of total time-loss claims, their pattern over time is essentially the same as the total time-loss claim rates shown in Figure 1.

In Figure 2, the fluctuations, particularly in disease claim rates, may be vulnerable to different reporting practices and methods of data collection in a given year as well as to the relatively small numbers of claims involved and should therefore not be over-interpreted.
Pattern of injury claims during the study period

As outlined in the Methods section, for the purposes of this historical study, injuries were classified into 3 basic types (Appendix A). Figure 3 shows the proportion of strain, impact, and miscellaneous injuries accounted for in terms of time-loss claims.

Figure 3 shows that in 1970, approximately 15% of time-loss claims were due to strain. The 1970s witnessed a rapid increase so that by 1980, 45% of injury claims were due to strain. The increase over the next 16 years slowed markedly so that by 1996, half the time-loss claims were due to strain. Back strain represented approximately two thirds of strain injury time-loss claims per year between 1979 and 1996. The proportion of back claims to all time-loss claims was very steady during this time.

Pattern of industrial disease claims during the study period

During the 1960s, the average number of industrial disease claims per year was 1,011. This increased to 1,996 during the 1970s, 4,372 during the 1980s, and for the period 1990 to 1996, an average of 7,354 industrial disease claims were filed each year. These numbers indicate an increase in accepted industrial disease claims during the study period. Figure 4 shows the change in the proportion of industrial disease claim types during the study period.

In the 1960s, dermatitis was the largest single category of accepted industrial disease claims accounting for nearly 40%. (It should be noted that by the 1970s, the proportion of claims accounted for by dermatitis dropped to 12%. It is unclear why, as protective personal equipment such as gloves were not commonly used in BC’s forest industry until the early 1980s). This was followed by repetitive strain injuries (RSI), categorized until 1978 as either bursitis or tenosynovitis, representing 26% of claims. The third largest category in the 1960s was respiratory disease.

Between the 1970s and 1990s, claims for bursitis, tenosynovitis and (after 1979) carpal tunnel syndrome increased from 35 to 55% of all industrial disease claims. Because this is the single most important industrial disease category for most of the study period, this is shown in more detail in Figure 5.

Rates for tenosynovitis double from 0.5 to 1 accepted claims per 1,000 insured workers between 1959 and 1979 with all of this increase occurring during the decade of the 1970s. Between 1979 and 1987, rates declined to 0.75 claims per 1,000 insured workers. After 1987 there was a steep increase which peaked in 1992 at 2.2 claims per 1,000 insured workers. Since 1992 these rates have declined and were 1.6 claims per 1,000 insured workers by 1996. Claims for bursitis and carpal tunnel roughly followed this pattern.
CONCLUSION

Approximately 75 to 80% of British Columbia workers were covered by the WCB during the study period. The results of this investigation are therefore only valid for these insured workers. This points to both a strength and a weakness of an historical epidemiology study which rests on this type of administrative data base. On the one hand, continuity of the data source for over 45 years provides a long-term picture of both rates and patterns of industrial disease and injury. On the other hand, the investigation excludes 20 to 25% of BC’s working population.

There are several other limitations in this study besides this one. First, data have been used in this investigation in an entirely descriptive fashion. As outlined in the introduction, the focus has been historical more than epidemiological. Any associations shown in this investigation are descriptive and must be interpreted as such. Second, definitions of disease and injury categories have shifted over time so that comparisons between categories across time may not be precise. This second limitation must be balanced against the ability for this kind of analysis to generate broad temporal patterns.

In spite of these limitations, a number of interesting patterns emerge. First, death report rates (and their closely associated fatality claims rates) declined steadily by 79% during the study period. This may be related to the movement from a largely resource to service economy which occurred in the province during this time. Injury report rates also declined, although less dramatically, by 29% over the 46-year study period with much of the decrease occurring prior to 1970.

When viewed in relation to the changing pattern of injuries reported to the WCB, the pre-1970 decline represents a reduction in impact injuries. While impact injuries may have been on the decline throughout the 1950s and 1960s, strain injuries began to make an impact on injury rates after 1970. A similar pattern was observed for industrial disease as the incidence of strain-based disease claims also increased rapidly after 1970.

This pronounced trend towards “strain-related” injuries and disease creates new challenges for adjudication and prevention. The often “subjective” nature of strain injury and disease and the complex relationship between psychosocial factors (operating at the task and organizational level in the workplace) and back strain and other strain injuries complicates identification and adjudication of these. In terms of prevention, this investigation emphasizes the need for WCB policy and workplace injury epidemiology, to focus on the identification of “strain-producing” work situations. The identification of work organizational and job structural features which contribute to strain injury and disease and the elucidation of the relationship between these conditions and “physical” strain injuries should be a priority for injury epidemiologists and WCB policy makers.2-4

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REFERENCES


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Figure 5. Accepted repetitive strain disease claim rates per 1,000 insured workers.

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